

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date:

Region: Mooresville Regional Office
County: Cabarrus
NC Facility ID: 1300051
Inspector's Name: Melinda Wolanin
Date of Last Inspection: 12/03/2019
Compliance Code: 3 / Compliance - inspection

<p style="text-align: center;">Facility Data</p> <p>Applicant (Facility's Name): S&D Coffee, Inc.</p> <p>Facility Address: S&D Coffee, Inc. 300 Concord Parkway South Concord, NC 28027</p> <p>SIC: 2095 / Roasted Coffee NAICS: 31192 / Coffee and Tea Manufacturing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>	<p style="text-align: center;">Permit Applicability (this application only)</p> <p>SIP: 02D .0515, 02D .0521, 02D 1806 NSPS: NESHAP: PSD: PSD Avoidance: 02Q .0317 (for 02D .0902) NC Toxics: 112(r): Other:</p>
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Contact Data			Application Data
<p style="text-align: center;">Facility Contact</p> <p>Sal DiGiovanni Engineering Manager (704) 782-3121 300 Concord Parkway South Concord, NC 28027</p>	<p style="text-align: center;">Authorized Contact</p> <p>Scott Seebold VP of Operations (704) 782-3121 300 Concord Parkway South Concord, NC 28027</p>	<p style="text-align: center;">Technical Contact</p> <p>Sal DiGiovanni Engineering Manager (704) 782-3121 300 Concord Parkway South Concord, NC 28027</p>	<p>Application Number: 1300051.20A Date Received: 11/26/2019 Application Type: Modification Application Schedule: TV-Significant <p style="text-align: center;">Existing Permit Data</p> Existing Permit Number: 05029/T19 Existing Permit Issue Date: 07/18/2019 Existing Permit Expiration Date: 03/31/2021</p>

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2018	0.0400	6.79	74.75	17.87	12.38	20.13	12.27 [Acetaldehyde]
2017	0.0400	6.70	82.33	18.49	12.23	21.49	13.00 [Acetaldehyde]
2016	0.0400	6.51	77.59	17.49	11.68	20.19	12.10 [Acetaldehyde]
2015	0.0600	9.52	78.87	5.66	11.95	20.57	12.34 [Acetaldehyde]
2014	0.0600	9.63	83.42	5.65	12.43	21.74	13.03 [Acetaldehyde]

<p>Review Engineer: Urva Patel</p> <p>Review Engineer's Signature: _____ Date: _____</p>	<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 05029/T20 Permit Issue Date: Permit Expiration Date:</p>
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1. Purpose of Application:

Currently, S & D Coffee, Inc. (S&D) holds Title V Permit No. 05029T19 with an expiration date of March 31, 2021. The TV-Significant modification permit application (**Application No. 1300051.19B**) was received on November 26, 2019.

The facility requests following:

- Installation of a new Dust Collector (**ID No. CD-5CBG-DC**) to handle particulate emissions from five existing coffee bean grinders (**ID No. ES-5CBG**) and associated ground coffee storage bins.
- Installation of a new coffee bean flavoring booth (**ID No. ES-CBFB**)
- Installation of a new Tea leaf flavoring station (**ID No. IS-TLFS**) as an insignificant activity.

2. Facility Description:

S&D located in Concord, Cabarrus County, North Carolina processes green coffee beans into roasted coffee products, including whole and ground beans. The coffee roasting process consists of cleaning, roasting, cooling, and packaging operations. The facility also mixes and packages tea leaves. Existing operations include six natural gas-fired coffee bean roasters each controlled by either a catalytic or thermal oxidizer, six cooling and de-stoning systems controlled by simple cyclones, and green bean and tea handling operations controlled by bagfilters. The facility operates the roasting process 24 hours per day, five to six days a week, and the packaging department operates 16 to 20 hours per day, six days per week, 52 weeks per year.

3. Application Chronology:

Application Chronology

November 26, 2019 Received application for Title V Significant modification permit.

December 6, 2019 Sent acknowledgement letter indicating that the application for TV-Significant modification permit was complete.

4. Summary of Changes to the Existing Permit (Permit No. 05029T19):

Page No.	Section	Description of Changes
Cover Letter	N/A	<ul style="list-style-type: none">• Update cover letter for application number, permit numbers, dates, fee class, PSD increment statement and Chief name.
Permit Cover	N/A	<ul style="list-style-type: none">• Insert new issuance, complete application date and application number.
	Insignificant Activity List	<ul style="list-style-type: none">• Added Tea Leaf Flavoring Station (ID No. IS-TLFS) as insignificant activity.
20-22 23	2.1 H 2.2 B	<ul style="list-style-type: none">• Added Dust Collector (ID No. CD-5CBG-DC)• Added Coffee Bean Flavoring Booth (ID No. ES-CBFB)

5. Compliance Status:

DAQ has reviewed the compliance status of this facility. During the most recent inspection conducted on December 3, 2019, Melinda Wolanin of the Mooresville Regional Office indicated that the facility appeared to be in compliance with all applicable requirements.

6. New/Modified Equipment/Changes in Emissions:

This application is submitted as a significant modification. The following modifications are being made to the permit:

- Installation of New dust collector (**ID No. CD-5CBG-DC**) to handle the exhaust from five existing coffee bean grinders (**ID No. ES-5CBG**) and associated ground coffee storage bin that currently exhaust indoors. Ground

coffee is pneumatically conveyed to the bins after grinding. Emissions from the dust collector will exhaust to atmosphere and this equipment is addressed as a permitted activity.

These five existing coffee bean grinders are going to be treated as new sources as they are now going to be exhausted to the dust collectors to the atmosphere rather than indoors.

Equipment ID No.	Equipment Description	Design Capacity (tons/hr)	Uncontrolled PM Emission Factor (lb/ton)	Uncontrolled PM Emissions (lb/hr)	Uncontrolled PM Emissions (TPY)	Controlled PM Emissions (lb/hr)	Controlled PM Emissions (TPY)
ES-5CBG	Five Coffee Bean Grinders	18.75	0.20	3.75	16.43	0.51	2.25

- Dust Collector Fan flow rating (cfm): 12,000
 - Loss through Cartridge Filter (gr/ft³): 0.005
 - PM, PM10 and PM2.5 emissions are all assumed to be equal.
 - Each grinder can handle 7,500 lb/hr of coffee beans
 - Coffee bean grinders are a batch operation
 - Maximum hourly throughput assumes all grinders operate simultaneously for 8760 hours per year.
 - Uncontrolled emissions assume loss of up to 0.01% based on process knowledge of S&D personnel familiar with this equipment.
- Installation of New Coffee bean flavoring booth (**ID No. ES-CBFB**) to improve the exhaust process during the mixing and preparation of liquid flavorings added to roasted coffee beans. Emissions are estimated to be above permitting thresholds and this equipment is addresses as a permitted activity.
 - Liquid flavoring will generate emissions of VOC. S&D provided safety data sheet (SDS) from the vendors that supply the liquid flavorings. On the review of SDS, thirteen ingredients contained data regarding contents of VOCs. No data provided for any TAPs/HAPs.
 - If a range of VOC weight percentages was provided on the SDS, the highest percentage was used to conservatively estimate the VOC emissions. Most of the flavorings highest VOC content was due to the presence of propylene glycol (PG). Though PG has a very low vapor pressure, it was assumed to be released to atmosphere as VOC during the spray application in the proposed flavoring booth.
 - VOC emissions are estimated using mass balance calculations based on the weight percentage of VOC determined from the SDS. These emissions are above the exemption rate. Therefore, this equipment is addressed as permitted source.

Pollutant	Material	Maximum Hourly Usage (lb/hr)	Weight %	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (TPY)
VOC	Caramel Vanilla	2.24	100	2.24	1.12
VOC	French Vanilla	18.11	7	1.27	0.63
VOC	Hazel Cream	9.64	100	9.64	4.82
VOC	Santa's White Christmas **	11.86	100	11.86	5.93
VOC	Blueberry Cinnamon H-Dew	1.23	2.20	0.027	0.013
VOC	Pumpkin Spice H-Dew	27.86	5	1.39	0.70
VOC	Kona Macadamia	1.43	100	1.43	0.72

Pollutant	Material	Maximum Hourly Usage (lb/hr)	Weight %	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (TPY)
VOC	Hot Buttered Rum	0.11	2.70	0.003	0.002
VOC	Bourbon Pecan	8	100	8	4
VOC	Highland Crème	0.56	100	0.56	0.28
VOC	Toasted Almond	0.75	60	0.45	0.22
VOC	Chocolate Irish Crème	0.15	100	0.15	0.07
VOC	Bavarian Strudel Cake	2.26	100	2.26	1.13
Total VOC	-	-	-	-	19.63

** Worst case scenario

- Liquid flavorings annual usage based on production data provided by S&D Coffee and accounts for a safety factor of 2.5 times the actual production.
- Hourly usage calculated from annual usage rate by dividing by 1000 hours of operation. Actual operational schedule is much lower.
- Only one flavor can be applied at any time so hourly usage rates are not summed.
- Installation of New tea leaf flavoring station (**ID No. IS-TLFS**) to improve the process of adding the liquid flavorings to tea leaves.
- Maximum Usage Rate: 7.73 lbs/hr
- Emissions are estimated to be below permitting threshold and this equipment is addresses as an insignificant activity. It needed to be documented as an insignificant activity on TV permit.

Material	Pollutant	Maximum Hourly Usage (lb/hr)	Weight %	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (TPY)
Liquid Flavorings (Worst-Case Composite)	VOC	7.73	29.55%	2.28	1.14

This source qualifies as an insignificant activity due to amount of emissions pursuant to 15A NCAC 02Q .0503(8). An insignificant activity means any activity

"...whose emissions potential emission of particulate, sulfur dioxide, nitrogen oxides, volatile organic compounds, and carbon monoxide before air pollution control devices, i.e., potential uncontrolled emissions, are each no more than five tons per year and whose potential emissions of hazardous air pollutants before air pollution control devices, are each below 1000 pounds per year."

Uncontrolled emissions of VOC from the proposed emission source are less than five tons per year as shown in the calculations above. No permit is required for installation and operation of this equipment.

Equipment being added to the list of permitted sources and control devices:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-5CBG	Five Coffee Bean Grinders	CD-5CBG-DC	Dust Collector
ES-CBF	Coffee Bean Flavoring	N/A	N/A

Equipment being added to the list of Insignificant activities:
 New tea leaf flavoring station (**ID No. IS-TLFS**)

• **Total Change in Emissions:**

Coffee Bean Roaster Pollutant	NEW Uncontrolled Potential Emissions, tons/yr	NEW Controlled Potential Emissions, tons/yr	OLD Uncontrolled Potential Emissions, tons/yr	OLD Controlled Potential Emissions, tons/yr
PM	1,029	31.9	1,012	29.6
CO	47.3	47.3	47.3	47.3
NOx	24.2	24.2	24.2	24.2
SO ₂	0.14	0.14	0.14	0.14
VOC	3,237	181.4	3217	161.8
Lead	1.20E-04	1.20E-04	1.20E-04	1.20E-04
CO ₂	47,038	47,038	47,038	47,038
CH ₄	11.9	11.9	11.9	11.9
N ₂ O	0.53	0.53	0.53	0.53
Acetaldehyde	570	32.0	570	32.0
Acetic Acid	535	26.8	535	26.8
Acrolein	7.50	0.38	7.50	0.38
Formaldehyde	312	15.6	312	15.6
Hexane	11.5	0.63	11.5	0.63

There is an increase in potential emissions of PM₁₀, therefore increment tracking will be required as Cabarrus County has been triggered for increment tracking under PSD for PM₁₀, SO₂, and NO_x.

Potential PM emission from the five coffee bean grinders (**ID No. ES-5CBG**) = 16.43 tons/year
*An increase of PM = 16.43*2000/8760 = 3.75 lb/hr*

7. Regulatory Review

A. The proposed equipment to be added are subject to the following regulations:

- 15A NCAC 02D .0515: Particulates from Miscellaneous Industrial Processes
 The allowable emission rates for PM from any stack, vent, or outlet, resulting from any industrial process for which no other emission control standards are applicable, shall not exceed the level calculated with the equation:

For process weight rates less than or equal to 30 tph,

$$E = 4.10 * P^{0.67}$$
 where, E = allowable emissions (lb/hr)
 P = process weight rate (tph)

Process	Process weight rate, tons/hr	Estimated hourly Controlled PM Emission rate, lb/hr	Allowable hourly PM Emission rate, lb/hr
Five Coffee Bean Grinders	18.75	3.75	29.22

To ensure compliance with this standard, the Permittee will be required to perform monitoring, recordkeeping and reporting for the operation of the associated control device. Compliance is expected.

- 15A NCAC 02D .0521: Control of Visible Emissions
 As per 15A NCAC 02D .0521(d), for sources manufactured after July 1, 1971, the visible emissions from the facility shall not be more than 20% when averaged over a six-minute period. However, six-minute

averaging periods may exceed 20% not more than once in any hour and not more than four times in any 24-hour period. In no event, shall the six-minute average exceed 87% opacity. The Permittee will be required to ensure compliance through monthly visible emissions monitoring, recordkeeping and reporting. Compliance is expected.

- 15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions
This state-enforceable only regulation is applicable to the Five Coffee bean grinders (**ID No. ES-5CBG**) with Dust Collector (**ID No. CD-5CBG-DC**), New Coffee bean flavoring booth (**ID No. ES-CBF**), and New tea leaf flavoring station (**ID No. I-TLFS**). Because, this rule shall apply to all operations that may produce odorous emissions that can cause or contribute to objectionable odors beyond the facility's boundaries as per 15A NCAC 02D 1806(c). Compliance is expected.

8. NSPS, NESHAP/MACT, NSR/PSD, 112(r), CAM

NSPS

This facility is subject to 40 CFR 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. This permit modification does not change this status.

NESHAP/MACT

This facility is a major source for HAPs emissions and is subject to the National Emission Standards for Hazardous Air Pollutants, 40 CFR 63, Subpart ZZZZ and Subpart DDDDD. This permit modification does not change this status.

NSR/PSD

Cabarrus County was designated as a moderate nonattainment area for the 1997 8-hour ozone standard. All counties in NC were re-designated as attainment effective August 27, 2015. [Ref: Federal Register /Vol. 80, No. 144 /Tuesday, July 28, 2015 /Rules and Regulations.] The facility is minor for PSD because it has accepted an avoidance condition pursuant to 15A NCAC 02Q .0317 for 15A NCAC 02D .0902, to limit VOC emissions to less than 100 tons per year. Cabarrus County's minor source baseline dates for PM₁₀, SO₂, and NO_x have been triggered.

Since the modification results in an increase in potential emissions of PM, increment tracking will be required.

Potential PM emission from the five coffee bean grinders (**ID No. ES-5CBG**) = 16.43 tons/year

*An increase of PM = 16.43*2000/8760 = 3.75 lb/hr*

The estimated increase in PM emissions are expected to be 3.75 pounds per hour (note that all of PM is assumed to be PM₁₀).

The US-EPA has not issued control technique guidelines for the coffee roasting industry. S&D will have a small increase in actual VOC emissions from the coffee bean flavoring booth and tea leaf flavoring process included in the Section 6. S&D will continue to track actual facility-wide VOC emissions to demonstrate the facility will remain below 100 tons per year.

112(r)

This facility is **NOT** subject to the requirements of the Chemical Accident Release Prevention Program, Section 112(r) of the Clean Air Act requirements.

RACT

As noted above, Cabarrus County was designated as a moderate nonattainment area for the 1997 8-hour ozone standard prior to all NC being re-designated into attainment. S&D has accepted an avoidance condition limiting VOCs to less than 100 tons per year to avoid applicability to RACT. The facility must keep the VOC avoidance condition in the permit, because the limitation was used to bring the area back into attainment. This permit modification does not change this status.

Compliance Assurance Monitoring (CAM)

The compliance assurance monitoring (CAM) rule requires the facility to conduct monitoring to provide a reasonable assurance of compliance with applicable requirements under the act. Monitoring focuses on emission units that rely on pollution control devices to achieve compliance with applicable standards. Per 40 CFR 64.5 (and 15A NCAC 02D .0614(e)), an analysis for CAM applicability is required to be submitted with a permit application for large pollution-specific emissions units (PSEU) at the time of application submittal. A large PSEU is one that has a post-control potential to emit of more than major source levels. The Dust Collector (**ID No. CD-5CBG-DC**) is not subject to the CAM since uncontrolled emissions are below 100 TPY.

9. Facility-Wide Air Toxics:

The current permit includes modeled emission rates based on previously approved modeling demonstrations. The most recent modeling was conducted in 2008 because of the addition of a new coffee roaster, ES-R6. The modeling reviewed by Tom Anderson indicated compliance with the acceptable ambient levels (AALs) on a source-by-source basis. This permit modification does not trigger a new air toxic review or request any changes of emission limits as it does not increase previous TAP limit nor emit any TAP. No further air toxics evaluation is required at this time.

10. Facility Emission Review:

Actual emissions for 2014 through 2018 are reported in the header of this permit review.

Since the modification results in an increase in potential emissions of PM,
Potential PM emission from the five coffee bean grinders (**ID No. ES-5CBG**) = 16.43 tons/year
*An increase of PM = 16.43*2000/8760 = 3.75 lb/hr*

11. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. South Carolina and Mecklenburg County-local program are an affected state and a local program within 50 miles of the facility.

12. Other Regulatory Considerations:

- The appropriate application fee was submitted with this permit application.
- A Professional Engineers Seal was submitted with this permit application.
- A zoning consistency determination was submitted for this permit application.
- A 30-day public notice and 45-day EPA review is required for this permit application.

13. Recommendations/Conclusion:

TBD